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10/600,520	06/19/2003	Shizhong Liu	MCS-005-03 (303702.01)	8588

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Mark A. Watson
Lyon & Harr
Suite 800
300 Esplanade Drive
Oxnard, CA 93030

EXAMINER	
CZEKAJ, DAVID J	
ART UNIT	**PAPER NUMBER**
2621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/600,520	LIU ET AL.	
	Examiner	Art Unit	
	DAVID CZEKAJ	2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) *12-25* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

On page 9, applicant argues that since the claims recite a physical computer readable media, the 101 rejection should be withdrawn. While the applicant's points are understood, the examiner respectfully disagrees. Even though the claims recite a physical computer readable media, the communication of data can still be done via a carrier wave which is directed towards non-statutory subject matter. Therefore the rejection has been maintained.

On pages 10-11, applicant argues that Ma fails to disclose determining true MV's from irregular MV's. While the applicant's points are understood, the examiner respectfully disagrees. See for example Ma column 10, line 60 – column 11, line 3. There Ma discloses determining true MV's from irregular MV's. In order to determine the irregular MV's, Ma repeats the steps twice (a second level) and then discloses in column 11, lines 30-51, using these irregular MV's for further processing (another level of processing). Therefore the rejection has been maintained.

On page 13, applicant argues that Tomizawa fails to disclose the evaluation of a second set of MV's based on a reliability of a first set of MV's. The examiner only relied upon Tomizawa to teach storing of the error values. Hence, when combined with Ma and Straasheijm, the references teach the evaluation of a second set of MV's based upon the reliability computed for a first set of MV's. Therefore the rejection has been maintained.

On page 15, applicant argues that Straasheijm fails to disclose operating at the second and subsequent levels based on searches of MV's that are deemed unreliable. While the applicant's points are understood, the examiner respectfully disagrees. The examiner relied upon Straasheijm to teach the determination of unreliable MV's. The Examiner relied upon Ma for the processing of second and subsequent levels. Hence, when combined, Ma in view of Straasheijm teach operating at the second and subsequent levels (continuing to search) based on searches of MV's that are deemed unreliable. Therefore the rejection has been maintained.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-11 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The specification on page 10 indicates the use of a carrier wave which is directed towards non-statutory subject matter which needs to be removed from the specification.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1-4, 6, and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Straasheijm (6968009) in view of Ma (7072398) in further view of Tomizawa (6208690).

Regarding claim 1, Straasheijm discloses an apparatus that relates to a method of finding motion vectors (Straasheijm: column 1, lines 10-14). This apparatus comprises "evaluating a first set of zero valued motion vectors" (Straasheijm: figure 5; column 4, lines 5-10, wherein the first set is the rough search which finds the rough motion vectors), "evaluating a second set of candidate MV's for each block in the frame based on the first set" (Straasheijm: figure 5; column 4, lines 42-45, wherein the second set is the search performed in the half-scaled frame), "evaluating a third set of MV's for all blocks in the image based on either the first or second set of MV's" (Straasheijm: figure 5; column 4, lines 47-54, wherein the third set is the third search performed on the fill frame), and "outputting an optimal motion vector" (Straasheijm: figure 5, wherein the optimal MV is the final MV). However, this apparatus lacks computing the reliability and using spatial, temporal, and block-based search pattern and the storage as claimed. Ma teaches that fast motion search algorithm is indispensable to the realization of real-time communication services (Ma: column 2, lines 23-26). Ma discloses an apparatus that determines a "reliability of each MV" (Ma: column 8, lines 1-5, wherein the reliability is the matching error), "evaluating MV's using spatial and temporal neighbors" (Ma: column 8, lines 25-29), and "using a block-based searching pattern" (Ma: column

5, lines 35-38, wherein the pattern is the diamond pattern). Tomizawa teaches that storing error values to a database the first time the MV is evaluated and then retrieving the error values instead of re-computing them reduces the number of transformations needed and eliminates the need for repeating searching motion vectors thus improving the efficiency of processing (Tomizawa: column 9, lines 39-45). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to take the apparatus disclosed by Straasheijm, add the processing taught by Ma, and add the storage taught by Tomizawa in order to obtain apparatus that more easily applies a fast matching algorithm to image frames.

Regarding claim 2, Ma discloses "the reliability is determined by computing error values for each block in the frame and comparing the error values to a threshold " (Ma: column 8, lines 1-5).

Regarding claim 3, Ma discloses "each block having a error value less than a first threshold is deemed to have a reliable MV" (Ma: column 8, lines 1-5; column 9, lines 30-32, wherein the reliability are the categories no motion, more, or less which indicate the degree of reliability).

Regarding claim 4, Ma discloses "the optimal MV is determined by computing error values and selecting a MV having the smallest value" (Ma: column 7, lines 28-34).

Regarding claim 6, Straasheijm in view of Ma disclose "a second error threshold is computed as a minimum error value of the spatial and temporal neighbor blocks" (Straasheijm: figure 5; Ma: column 8, lines 25-29).

Regarding claim 9, Ma discloses "the pattern search is a diamond search" (Ma: column 5, lines 35-38).

2. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Straasheijm (6968009) in view of Ma (7072398) in further view of Tomizawa (6208690) in further view of Yang (6990148).

Regarding claim 5, note the examiners rejection for claim 1, and in addition, claim 5 differs from claim 1 in that claim 5 further requires comparing the MV's with a second threshold in which Yang teaches in figures 7, 9, and 11-14). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the optimal MV determined using a second threshold in order to more accurately determine the optimal motion vector.

3. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Straasheijm (6968009) in view of Ma (7072398) in further view of Tomizawa (6208690) in further view of Yang (6990148) in further view of Kim (6947603).

Regarding claim 7, note the examiners rejection for claim 1, and in addition, claim 7 differs from claim 1 in that claim 7 further requires comparison with a third threshold. Kim teaches that current motion algorithms require a huge amount of calculation (Kim: column 1, lines 30-35). To help alleviate this

problem, Kim discloses an apparatus comprising "if the error value is larger than a threshold, the set of MV's comprises the entire search range and if the value is smaller, the set of MV's comprises the immediate neighbor MV's" (Kim: figures 1-2; column 4, lines 38-60; column 5, lines 12-24). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the comparison taught by Kim in order to obtain an apparatus that helps reduce the amount of calculations needed for determining a reliable MV.

Regarding claim 8, Yang discloses "the threshold is computed as a max of the computed error values of the neighbor blocks" (Yang: figures 9 and 13).

4. Claims 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Straasheijm (6968009) in view of Ma (7072398) in further view of Tomizawa (6208690) in further view of Carr (6118823).

Regarding claim 10, note the examiners rejection for claim 1, and in addition, claim 10 differs from claim 1 in that claim 10 further requires an array of error values. Carr teaches that the use of an error array enhances system performance (Carr: column 3, lines 1-6). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to implement the error array taught by Carr in order to enhance the overall system performance.

Regarding clam 11, Carr discloses "if an error value has already been computed, it is read back from the array" (Carr: column 2, line 62- column 3, line 6, wherein the array is read from and wrote to).

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to DAVID CZEKAJ whose telephone number is (571)272-7327. The examiner can normally be reached on Mon-Thurs and every other Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Dave Czekaj/
Primary Examiner, Art Unit 2621